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Novel Scheme to Fabricate SiGe Nanowires Using Pulsed Ultraviolet Laser Induced Epitaxy

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Abstract

A novel scheme is employed to fabricate SiGe nanowires in a Si(100) substrate using pulsed ultraviolet (UV) laser induced epitaxy. In particular, Si(100) substrates are patterned with arrays of Ge wires □60 nm in width and □6 nm in thickness. A thin film low temperature silicon oxide is then deposited on the substrate. SiGe nanowires with a cross section of □25×95 nm2 are formed using pulsed UV laser induced epitaxy. The structures are analyzed using scanning electron microscopy and cross-sectional transmission electron microscopy. Potential applications of the wire structure include base formation in a lateral SiGe heterojunction bipolar transistor and direct formation of SiGe/Si quantum wire structures in a silicon chip.